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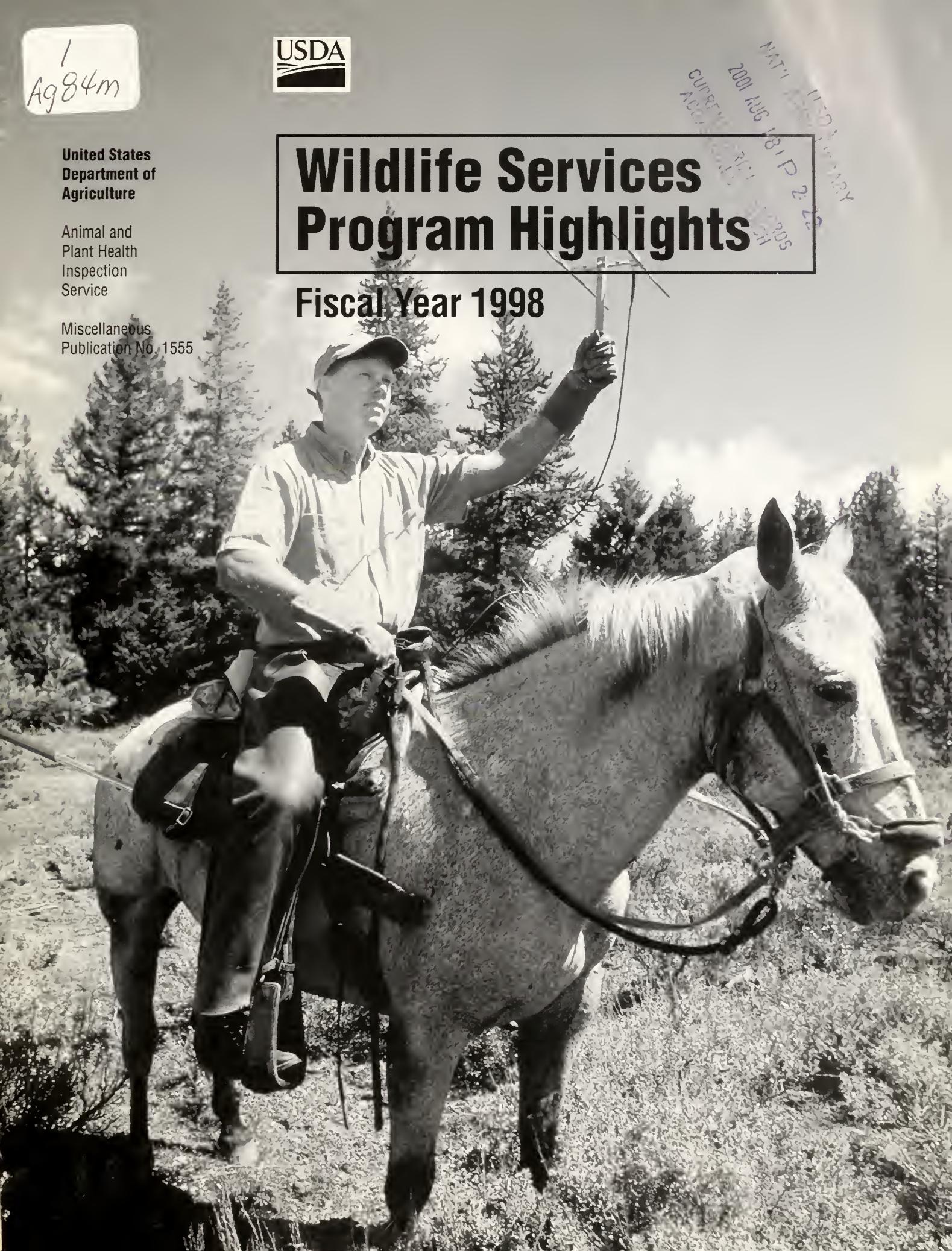
Wildlife Services Program Highlights

Fiscal Year 1998



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Issued June 1999

INTRODUCTION

Since 1985, the Federal Government's efforts to manage wildlife damage to agricultural and other resources have been centralized in the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS). APHIS' Wildlife Services (WS) program works to minimize the effects of wildlife on livestock and crops and to protect human health and safety, property and industrial resources, and natural resources, including threatened and endangered wildlife species, from wildlife damage as well.

This report documents WS' accomplishments during fiscal year (FY) 1998. Preparing the 1998 highlights report is one way we are working to keep the public and our State and local cooperators better informed about WS activities. To learn more about our research activities, you are encouraged to request a copy of the National Wildlife Research Center Highlights Report, Fiscal Year 1998 (USDA Miscellaneous Publication 1552). Write to USDA– APHIS–NWRC, 4101 LaPorte Avenue, Fort Collins, CO 80521–2154. For more details about the overall WS program, please write to:

Director, WS
Operational Support Staff
USDA–APHIS
4700 River Road, Unit 87
Riverdale, MD 20737–1234
You may also visit the WS home page at www.aphis.usda.gov/ws on the World Wide Web.

PROGRAM HIGHLIGHTS

Program Development Activities

During FY 1998, total funding supplied to WS from cooperators increased by approximately $2.6 million.

In Alabama, for example, the legislature approved a $150,000 funding package for general wildlife damage management and the Department of Defense (DoD) also increased its funding by 29 percent to $90,000 to manage wildlife conflicts at the Redstone Arsenal Missile Facility in Huntsville.

In Arkansas, WS will expand migratory bird damage management with emphasis on fish-eating bird damage to aquaculture and fishery resources under a new $130,000 funding package approved by the Arkansas Game and Fish Commission.

The California Department of Food and Agriculture is increasing local State funding to WS by $900,000 over the next 2 years to enhance protection of agriculture from wildlife damage.

Overall, WS has experienced a 9.1-percent increase in total cooperative funding from FY 1997 to FY 1998.

Government Performance and Results Act (GPRA)

The GPRA, passed by Congress in 1993, requires Federal agencies to have a strategic plan and to report annually to Congress data proving that federally allocated funds are being turned into results for American taxpayers. While the first results report is not due to Congress until the end of FY 1999, WS pilot-tested selected performance measures in 1997 and gathered data on performance measures for most wildlife damage-management programs in 1998. The U.S. Office of Management and Budget recognized WS for the approach taken in the agency performance plan.

One example of GPRA data develop-ment involves cost–benefit analysis:

- Beaver damage-management activities conducted in North Carolina in 1997 averted the impending loss of an estimated $3.8 million worth of forest and agricultural resources, waterways, and highway infrastructures. The cost–benefit ratio of WS services was 1 to 5.8: for every $1 spent, $5.80 worth of benefits accrued.

Through an aggressive approach to complying with GPRA, WS hopes to develop similar cost–benefit data for all significant program work.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) process has become a management and planning tool for WS State programs. NEPA environmental assessments are routinely developed by Federal agencies to analyze the impacts of proposed actions and to provide the best environmental information available for planning and decisionmaking.

WS Pesticide Certification Program

To ensure that WS personnel are highly trained and appropriately certified to use a wide range of tools and techniques, WS has initiated the establishment of a national pesticide training and certification program. This program will operate in conjunction with existing State certification programs.

Brown Tree Snake (BTS) Control Program

The BTS is a major threat to the biodiversity of the Pacific region and the U.S. mainland. This snake has already killed most of Guam's native terrestrial vertebrates, including fruit bats, lizards, and virtually all of the island's forest birds. In addition, BTS's in Guam have caused more than a thousand power outages, damaged agricultural interests by preying on poultry, killed pets, and bitten many children.

The BTS also presents an enormous impediment to military maneuvers in the region because of the potential for accidentally moving the pest to new areas when it hides inside military vehicles.

Working in cooperation with the DoD and Department of Interior (DoI), and in partnership with the Governments of Guam and Hawaii, WS continues a major effort to control the BTS on Guam and prevent its leaving the island. In FY 1998, WS received $2,011,000 in cooperative funding—$1 million from DoD and the rest from DoI. DoD has also provided $297,000 for research to develop methods for use in an integrated pest management strategy. WS expended $56,000 in support services for the BTS program in Guam.

The objective of the BTS program is to establish snake-free zones around military and civilian airports, including shipping facilities on Guam. WS field personnel remove snakes

from civilian and military cargo, aircraft, and ships in order to prevent the transport of the snakes to other Pacific islands and the U.S. mainland.

Control methods include traps, detector dogs, night searches, habitat modifications, and removal of the prey base. WS personnel use 14 Jack Russell terriers to detect and control the snakes in military and civilian cargo at transportation facilities.

Measurable benefits obtained as a direct result of the operational and methods development program include

(1) an established islandwide line of defense that has effectively slowed or curtailed the inadvertent spread of the species;
(2) increased public education through the production of two BTS training videos, an information color poster, and wallet-sized cards. Together with positive media recognition, this outreach effort has achieved snake reduction in high-risk areas.
(3) registration of one new cargo fumigant and identification of two others;
(4) identification of several products that are toxic to snakes and a potential repellant; and
(5) identification and field evaluation of potential attractants to replace live mice in operational trapping.

In addition to the control program on Guam, WS provides training and snake control supplies to emergency snake control teams in Hawaii and the Commonwealth of the Northern Mariana Islands and, on request, provides personnel to monitor DoD training sites on Saipan and Tinian during DoD exercises. In cooperation with the State of Hawaii and DoD, WS is the lead agency for investigating reported BTS sightings in the State.

Helping Small Farms

WS strongly supports USDA's commitment to helping the country's thousands of small-farm interests and property owners. The work of WS is vital to small farmers, who are already struggling with difficult economic conditions nationwide. One way WS provides assistance to resource and property owners is through cooperative agreements. The service that WS provides under these agreements helps to minimize the negative impacts of wildlife on agriculture, property, natural resources, and human health and safety.

The current definition of "small farm," as developed by the National Commission on Small Farms, is any farm with annual gross receipts below $250,000. Using that criterion, USDA's National Agricultural Statistics Service (NASS) reports that the average size of U.S. farms with gross sales of less than $250,000 is 1,129 acres. In examining our agreements with property owners over all 50 States, we find that, in our Western Region, 74 percent of WS cooperative agreements are with farmers, ranchers, and other private entities, including farmers, that are likely to have total sales less than $250,000.

Though WS activities in our Eastern Region are more varied (i.e., agreements with agricultural producers make up a smaller proportion of our work than in the Western Region), the protection of resources on farms and ranches is still a vital component of our work. The NASS data show that in the Eastern Region there are no States where the mean average farm size is greater than 1,129 acres. These data strongly suggest that a major portion of WS agreements with farmers and ranchers in the Eastern Region are likely to be with small farms and ranches.

Food Donation

WS helps to feed the hungry by donating wild game, taken during field activities, to food banks or regulated processing facilities, where the game is appropriately inspected and processed. In 1998, WS contributed about 11,500 lb of venison to food banks. Food banks that received donations included, but were not limited to, Macon Food Bank in Georgia, the Salvation Army in Iowa City, Charleston area food banks in South Carolina, and the Greater Chicago Food Depository in Illinois.

Preparing for the Year 2000 (Y2K)

Our national computer reporting system, the Management Information System (MIS), underwent a significant conversion this fiscal year. New computers were purchased and installed in all 26 of our data-processing sites. The MIS program was updated from Oracle version 5.1 to version 7.0, and all data were transferred to the new system. This action was necessary to ensure Y2K compliance and was an essential step in the planned move to our third-generation reporting system, MIS 2000.

Public Information and Activities

Living with wildlife is a challenge that requires careful and responsible management. In January 1994, APHIS kicked off a public outreach effort, the Living With Wildlife campaign, to educate the general public, and especially young people, about the importance of balancing the needs of wildlife with the needs of people. Our educational project uses this message to highlight how WS professionals work with the public, industry groups, growers, special interest groups, and local and State agencies to find humane, environmentally safe, and socially acceptable solutions to wildlife problems.

An active campaign to place WS educational materials in classrooms is continuing. Since January 1995, more than 40,000 teachers nationwide have received Living With Wildlife posters, activity sheets, factsheets, brochures, the "Living With Wildlife" video, and pens, pencils, and rulers. In cooperation with Colorado, North Dakota, Nebraska and Nevada Ag in the Classroom programs, WS Living With Wildlife educational readers continue to be developed and distributed to more than 5,000 teachers in those States. This year, a national WS reader will be pilot-tested in several States, as well. In addition, the program has a new BTS Website.

In the fall of 1998, WS launched a print, video, and radio public service announcement (PSA) campaign called "The Nature of Our Business." The PSA's are targeted to an urban audience and focus on WS' commitment to protecting public health and safety, pets, urban and natural resources, agriculture, and threatened and endangered species.

WS worked closely with the Louisiana Department of Wildlife and Fisheries, the Black Bear Conservation Committee, and other organizations to increase public awareness about the Louisiana black bear. Emphasis was placed on publicizing the importance of reporting black bear conflicts rather than harming offending bears. The Louisiana and Mississippi WS programs were recognized with the Black Bear Conservation Committee Chairman's Award for commitment to the restoration efforts for this species.

The library at WS' National Wildlife Research Center (NWRC) continued its commitment during 1998 to expand electronic access to publications and other research information. The NWRC Website was updated to enhance overall appearance and readability. Additions included new photos and text, the 1996 and 1997 NWRC highlights reports, 1998 Research Update, annual publications lists between 1990 and 1998, the Center's general information brochure, and introductions to the various Center research programs with image map links to corresponding projects.

NWRC Information Services staff mailed out more than 400 copies each of its "Contraception in Wildlife Management" and "Repellents in Wildlife Management Proceedings," another 3,000 copies of the 1997 Highlights Report, the Research Update, the new Center brochure, and the 1997 annual publications list. More than 11,000 photocopies of inhouse library materials were made and distributed to individuals and WS

project personnel on subjects such as corvid predation on shore birds, plant species with possible chemical repellent properties, deer and black bear damage, gull predation on salmon and trout, vulture control and ecology, and food habits of such species as the yellow bittern and the bullfrog.

Bird Strike Committee–USA Conference—Working in cooperation with the City of Cleveland, NWRC biologists organized the eighth annual meeting of the Bird Strike Committee–USA (BSC–USA), held at Burke Lakefront Airport, Cleveland, OH, in June 1998. The meeting was attended by 320 people and received extensive newspaper and television coverage.

In all, 25 technical papers and posters were presented on topics related to reducing wildlife collisions with aircraft. A highlight of the conference was the demonstration of 20 techniques for managing wildlife at airports during an all-day field trip to the airport and a nearby gull colony. Fourteen companies exhibited their wildlife management products.

The goal of BSC–USA is to increase communication and professionalism among the diverse groups dealing with wildlife issues at airports, and the 1998 meeting appeared to be highly successful in this regard.

Buck Island Reef National Monument, U.S. Virgin Islands— Biologists from WS' Alabama State office and NWRC assessed the rat populations at Buck Island Reef National Monument, U.S. Virgin Islands, at the request of the National Park Service in February 1998. The rats, a nonnative species, are preying on eggs and hatchlings of endangered sea turtles and least terns. WS staff confirmed the presence of a substantial rat population over the entire island and extensive damage to native vegetation. WS biologists also confirmed the continued presence of a mongoose population, based on tracks, despite a Park Service eradication effort in the 1980's.

WS and Park Service biologists developed a plan for a rat and mongoose monitoring and management program with the eventual goal of eradicating both species from Buck Island. Eradication is essential before a proposed reintroduction of the endangered St. Croix ground lizard can proceed.

Galápagos National Park, Ecuador, Workshop—NWRC scientists participated in a planning workshop in the Gal'pagos National Park, Ecuador. The workshop focused on strategies for protecting critical habitats for giant tortoises on Isabela Island by removal of more than 100,000 feral goats whose population has grown drastically since introduction in 1979. Participants represented the Ecuador National Park Service, the Charles Darwin Foundation, LandCare Research (New Zealand), the U.S. Dol's U.S. Fish and Wildlife Service (FWS) and U.S. Geological Survey, APHIS, and several private consulting companies.

The group spent several days visiting habitat areas (primarily rough lava with thick scrub forest vegetation), evaluating the existing program and several proposals and developing a draft plan and cost estimates for future use by the Ecuador National Park Service. Partial funding for this effort has been obtained, and a program to remove the goats will be implemented in the near future.

Armed Forces Pest Management Board Meeting—NWRC biologists represented the WS program at the annual meeting of the Armed Forces Pest Management Board held in January 1998 at the USDA Agriculture Research Service (ARS) conference center in Gainesville, FL. This meeting reviews USDA research of interest to the DoD and provides the basis for DoD recommendations to USDA for future research activities. Representatives from ARS and the USDA Forest Service also attended. Overviews of NWRC research activities, an update on BTS research, and findings on research to reduce bird–aircraft collisions at military installations were presented. The last of these presentations specifically related to the use of infrared cameras to monitor deer populations, management of tall grass at airports, tests of Canada goose repellants, and management of woodpecker damage. NWRC presently receives funding from DoD and the Federal Aviation Administration (FAA) for research in these areas.

Sunflower Research Workshop—During this workshop, held in January 1998 in Fargo, ND, NWRC biologists presented poster sessions on cattail-spraying operations in North Dakota and blackbird densities and sunflower damage in Stutsman County, ND. Attendees included public and private researchers from France, Brazil, Canada, Belgium, Australia, and the United States.

Cormorant Management Workshop—NWRC biologists participated in a 2-day regional workshop in January 1998 in Glen Falls, NY, to discuss cormorant management in the Northeast. The workshop was sponsored by the Northeast Wildlife Administrators Association in cooperation with WS and FWS. Participants included various U.S. and Canadian Federal, State, and university administrators and scientists from the Northeast. The workshop focused on biota–natural community impacts, fisheries impacts, and human dimension issues. A proceedings will be issued early in 1999 summarizing the presentations by workshop participants and their recommendations relating to future management and research needs.

Workforce Planning

In October 1997, APHIS launched the Leadership for Today and Tomorrow Program (LTTP), an 18-month agency training program designed to encourage employees to take leadership responsibility and positive action, make improvements and lead change, and contribute to the overall performance and effectiveness of the organization. LTTP participants were selected on the basis of their demonstrated potential to adapt to this leadership paradigm and a willingness to learn and use new tools and skills. Selected to participate were several WS employees, including M. Alton Dunaway, Jon Heisterberg, and Bret Dunlap.

Robert Schmidt, a professor in the Department of Fisheries and Wildlife at Utah State University (USU) in Logan, UT, began an extended tour in the WS Deputy Administrator's office. This extended visit is designed to provide WS with an independent perspective in regard to ongoing and future programs and also help Dr. Schmidt understand national policies and administration relating to WS.

NWRC Activities

In January 1999, NWRC staff in Fort Collins, CO, moved from three temporary buildings into a new headquarters laboratory and office building, the NWRC Wildlife Services Building, located on 43 acres on the Foothills Research Campus of Colorado State University (CSU).

The new building houses all NWRC staff in Fort Collins except for the Animal Care staff, who are located in the adjacent NWRC Animal Research Building (ARB). The combination laboratory and office building was constructed by a private developer and is leased to NWRC. The building comprises 71,000 square feet of space, including specialized laboratories for research on birds, mammals, product development, and chemistry. Space is also allocated to the research library, record and tissue archives, a conference center, and office space for 100 NWRC staff, visiting scientists, and students.

The next phase of the master plan for this site also is under way. It includes construction of outdoor animal holding facilities and the ARB support wing. These facilities should be completed by the year 2000. Some additional construction will still be needed to complete the master plan.

NWRC currently has 18 multiyear research projects that address the research needs of the WS program and its stakeholders as determined during nationwide research needs assessments completed in 1989 and 1996.

Projects emphasize bird damage to agriculture, aquaculture, and aviation industries, mammal damage to the timber industry and to rangeland, coyote damage to the livestock industry and threatened and endangered species.

In 1998, the Center explored traditional methods development research such as improved traps and snares, maintenance of minor-use chemical pesticides, repellants and attractants, as well as novel approaches such as reproduction inhibitors and immunocontraceptives and innovative live-capture devices.

The Center's $9.1 million appropriated budget is annually supported by an additional $1.5 million through funding provided by as many as 25 cooperative and interagency agreements.

For more comprehensive information about NWRC's strategic planning and the scope of its research activities, request a copy of the Center's annual highlights report (USDA Miscellaneous Publication No. 1552) from the NWRC.

Following are selected examples of the Center's 1998 research:

National Trap Testing Program—The National Trap Testing Program to develop Best Management Practices for important furbearer species is advancing. A national program of this magnitude is a major undertaking. Program participants include the International Association of Fish and Wildlife Agencies, 17 State wildlife management agencies, participating private trappers, and two federal agencies (APHIS and FWS). Working together, these agencies are carrying out the commitments made by the U.S. Government to the European Union to improve animal welfare in U.S. trapping programs. The program will also benefit future workers in this field because the technical information base on traps and trapping will be greatly expanded.

Predation Control Via Contraception—WS researchers are working with Berryman Institute students at USU to determine whether sterilized coyote pairs can maintain their social status but reduce predation on sheep and lambs. Earlier work related to the biology of den hunting established that removal of coyote pups from dens had virtually the same impact in reducing spring predation as removal of the adults. Findings from the current study will assist managers in determining the utility of contraceptive techniques for managing predation in areas where feeding pups plays a role in prey selection by adult coyotes. As suitable oral contraceptives become available to wildlife managers, selective treatment of coyote den sites or individual territories might be an immediate and more practical use of the technology in some areas.

Beaver Damage Control—NWRC scientists have continued to examine a variety of options to improve the ability to manage beaver damage. Last year, a patent was awarded for an electroshocking invention that may have application in deterring beaver activity around culverts or hydraulic structures. During 1999, an NWRC technician will be collocated in Mississippi to collaborate more effectively with local WS operations personnel in developing new beaver damage-management methods.

Aquaculture—NWRC has a field station at Starkville, MS, to address bird problems to the aquaculture industry. Here are some of that unit's significant findings from FY 1998:

- Catfish farming may have contributed to the recovery of cormorant populations. Cormorants at catfish ponds are heavier and have more body fat than those collected in areas without catfish farms. These data suggest that catfish farms contribute to improved overwinter survival of cormorants.

- Wading birds (egrets and herons) may not greatly affect catfish farm production. While catfish make up 11 percent of the diet of great egrets and 44 percent of the diet of great blue herons, pen studies of great blue herons indicate that they are inefficient foragers on healthy catfish. In fact, these birds can take only fish near the surface due to oxygen stress, feeding patterns (accessing floating food), or sickness. However, herons and egrets can be a significant factor in stock losses at tropical aquaculture facilities in Florida. Ponds protected by netting averaged losses far lower than those without netting (2–23 percent *v.* 14–82 percent). Economic losses can be as high as $3,600/pond. Two-strand electrical fencing can help reduce these losses.

- White pelicans are emerging as a concern for the catfish industry. Populations of pelicans are increasing, and catfish ponds are an important winter habitat for pelican populations. Impact studies continue.

Bird–Aircraft Safety—NWRC's research on human health and safety related to bird–aircraft hazards is based at its Sandusky, OH, field station.

- Work at John F. Kennedy International Airport (JFKIA) in New York and other problem locations has shown that gull control apparently has not affected the overall laughing-gull population along the Atlantic coast, although it has reduced the numbers of these birds in problem locations. Breeding-bird survey data indicate no change in gull populations since the inception of the JFKIA gull control program in 1991. Aircraft strikes due to these gulls have been reduced by 66 percent.

- NWRC oversees a data-base management system for FAA that monitors wildlife–aircraft collisions and economic losses caused by such collisions. There have been more than 19,000 wildlife–aircraft strikes reported between 1990 and 1998. These strikes cause economic loses estimated at $200 million/year for civilian aircraft and $112 million/year for military aircraft. This data base will help managers target their control measures more effectively and draw attention to the scope of this wildlife–human conflict.

New Solutions for Wildlife Problems Through Biotechnology—NWRC scientists are currently testing immunocontraceptive vaccines on four species: white-tailed deer, coyote, Norway rat (rodent model), and coturnix quail (avian model). Work is also being conducted to develop oral delivery systems for vaccines and to gain Food and Drug Administration (FDA) approval for vaccines.

- NWRC is in the second year of a cooperative project with Cornell University at the Seneca Army Depot in central New York to develop field applications of contraception for deer. During 1997, 33 white-tailed deer were vaccinated with a gonadotropin-releasing hormone (GnRH) immuno-contraceptive vaccine. These 33 deer produced only 4 fawns, or 0.12 fawn/doe, as compared with 1 fawn/doe in the control group. During 1998, in addition to the 33 GnRH deer, 25 deer vaccinated with porcine zona pellucida (PZP) were added to the study. NWRC scientists are also testing single-dose GnRH vaccines using Freund's adjuvant and a new water-soluble adjuvant. Such single-dose vaccines will make immunocontraception a more practical tool for wildlife management. All deer were vaccinated using a dart gun.

Fawning counts indicate that contraceptive vaccines have been very effective.

- New and improved methods are needed to deter predators from killing livestock. NWRC and CSU scientists tested the effectiveness of an electronic dog-training collar for deterring captive coyotes from killing domestic lambs by shocking coyotes whenever they attempted to attack lambs during a 22-week period. The electronic collar averted all 13 attempted attacks on lambs by 5 coyotes, greatly reduced the probability of attempted attacks, and caused coyotes to avoid and retreat from lambs for more than 4 months. This aversive conditioning approach has potential for reducing coyote predation on domestic sheep in limited areas and may be applicable to a variety of other problems involving carnivore predation on domestic or endangered species.

- Effective nonlethal chemical repellants have been developed to protect commodities from being eaten by birds. However, these repellants require direct application to the surface of the resource to be protected, and birds must sample the material before they are repelled. This sampling leads to crop damage and, if the bird population is sufficiently large, will result in unacceptable economic losses.

- Working in cooperation with a CSU master's degree student, WS scientists evaluated an integrated hazing system designed by Knight Piesold, Ltd., and employed at PacifiCorp's Jim Bridger Power Plant in Wyoming. The concept behind this system was to combine existing bird-control technologies into a system that would protect large areas by preventing birds from landing on contaminated ponds for extended time periods. The system consisted of pyrotechnic launchers, acoustic scaring devices, and aerosol sprayers. Control and activation of the system were achieved using specialized software, a computer, and marine radar. The computer and radar were critical to the success of the system because they enabled the setup to activate the hazing devices when birds flew within the protected airspace only and to turn on just those devices near the intruders. The aerosol-applied chemical repellant reinforced the visual and audio scaring devices.

  Over the course of a year, this demand-performance integrated system was 85-percent effective in reducing flyovers by waterfowl at two desulfurization ponds and 92-percent effective in reducing landings relative to the control pond. Moreover, the 24-h protection afforded by this system was 60 percent better at detecting birds than were ground observers. Using it resulted in annual savings of 4,000 hours of labor for the power company over labor expended on normal hazing operations. It may be possible to adapt this system to protect catfish ponds from depredating birds.

Development of Analytical Chemistry Methodology for Wildlife Research—The goal of this research is to develop and apply new analytical chemistry techniques and approaches to wildlife research problems. A few examples follow.

- To minimize degradation of DRC–1339 (a chemical to deter bird damage) on bait formulations, WS researchers developed a protective coating for DRC–1339-treated rice.

- NWRC scientists have developed several methods to identify and analyze animal odors, such as the volatile components in rotting mice and coyote attractants. Data on mice were used to assist NWRC researchers in developing an artificial rotting mouse "perfume" for trapping BTS's on Guam. Data on coyote lures are being used to determine which classes of compounds are likely key ingredients of canid attractants.

- In studying the chemical ecology of black-bear foraging, NWRC investigators have found that bear damage to trees is more likely when the carbohydrate content of vascular tissue is high and/or terpene content is low. Analyses of samples from trees suggest that carbohydrate content increases after nitrogen fertilization or thinning and decreases after pruning. These data offer the timber industry some nonlethal approaches to reduce timber losses resulting from bear damage.

Registration of Pesticides and Drugs—NWRC maintains existing and develops new pesticide registrations with the Environmental Protection Agency (EPA) and drug authorizations with the FDA for compounds needed in WS program activities.

- Since 1989, seven active ingredients (carbon, sodium nitrate, sodium cyanide, Compound 1080, DRC–1339, zinc phosphide, and strychnine) have been reregistered. The registration unit coordinates three consortia (strychnine, zinc phosphide, and DRC–1339) that have a combined responsibility for reregistration of more than 90 vertebrate pesticides maintained by more than 30 registrants.

- NWRC maintains four Investigational New Animal Drug authorizations with FDA for two drugs (tranquilizer trap tab and alpha chloralose) and two immunocontraceptive vaccines (PZP and GnRH). In 1998, NWRC initiated discussion with FDA concerning three potential avian contraceptives. Preliminary testing on waterfowl is planned for 1999.

- NWRC personnel developed and published guidelines for the use of the Tranquilizer Tab Device (TTD) for wolves, coyotes, and feral dogs. Three training sessions for WS employees have been conducted. Use of TTD's in these control activities will allow WS employees to more effectively and humanely use traps in dealing with key species.

PROTECTION OF AGRICULTURAL RESOURCES

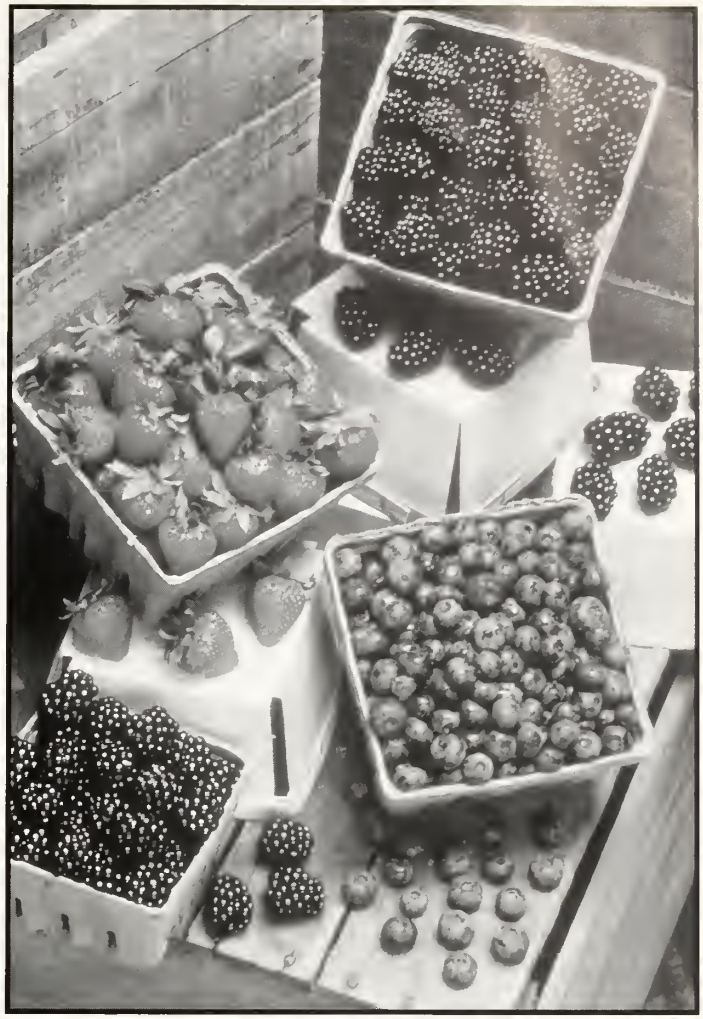
WS is an integral part of cooperative efforts to protect farm crops and aquaculture resources, such as catfish, from damage caused by wildlife. NASS and other researchers have previously documented annual predation losses to selected commodities across the United States. These losses include greater than $110 million for blueberries, corn, and sunflower and greater than $14 million for catfish and trout. Total wildlife damage to all agriculture, except forestry, in the United States is estimated at between $600 million to $1.6 billion annually.

Though several types of animals may potentially cause damage to agricultural farm crops, birds and deer are recognized to cause the most damage. Throughout the United States, birds and deer damage sunflower, rice, corn, winter wheat, and other agricultural crops.

For instance, each year, blackbirds cause severe damage to ripening crops in the Dakotas and Minnesota. Scientific surveys show that blackbirds damage $4 million to $11 million worth of sunflowers alone each year in these three States. WS personnel provide assistance to farmers through cooperative programs aimed at controlling damage through habitat manipulation, behavioral modification, and population management. WS provides technical assistance to producers concerning the management of cattail marshes—the environment where blackbirds in the Great Plains tend to roost. WS conducts hazing activities to move birds away from areas of crop production. In some circumstances, WS conducts operative research actives aimed at reducing populations of blackbirds causing damage to crops.

Predator management continues to be a major focus in the Western Region. All Western States except Hawaii, Alaska, and Kansas have major protection programs, and several programs received funds to hire additional personnel for livestock protection. In addition, the Nevada State legislature continues to support an effort to fund additional personnel.

The population of gray wolves continues to increase in Montana, Wyoming, and Idaho. Because of stepped-up demand for assistance (i.e., more than 32 requests), WS worked to secure additional funding so responding to more routine program activities would not be delayed. Because it is easier to control problem wolves when they can be reliably located, WS agreed to assist Idaho's Nez Perce Tribe in trapping and collaring wolves that do not have radio collars or replacing existing collars that have failed.



WS cooperated with FWS to develop a depredation order for double-crested cormorants thus allowing producers to quickly address damage problems caused by these birds without having to go through the lengthy permitting process with FWS.

At the request of the Michigan Department of Agriculture (MDA), WS initiated a white-tailed deer depopulation project on the 1,500-acre Muy Grande Ranch in Presque Isle County. MDA ordered the depopulation after bovine tuberculosis was confirmed in the confined herd. In cooperation with MDA, WS removed 97 deer from the herd of 600. This project will continue until September 30, 2000

The Need for and Results of Aquaculture Protection

A 1998 NASS survey of producers in the 15 largest catfish-producing States in 1996 revealed that 69 percent of the producers reported some wildlife-caused losses. Though the value of wildlife-caused losses varied across these areas, overall, producers lost $11.5 million worth of catfish to wildlife. The sum of dollars spent trying to prevent wildlife-caused losses plus the value of wildlife-caused losses totaled $17 million. In 1996, sales of catfish in the United States totaled $424 million. Thus, costs for prevention of damage and the value of the damage that did occur amounted to 4 percent of all catfish-generated revenue.

The highest rate of loss—84 percent—was reported in Mississippi. The average cost of wildlife-caused loss from all States was $13,700 per operation reporting a loss, while the average expense to prevent loss was $6,200. Birds (e.g., the double-crested cormorant) were most frequently cited as the cause of losses.

WS personnel provide both direct and technical assistance to fish producers through cooperative efforts to manage fish losses caused by birds. WS personnel also work closely with State and other Federal agencies to provide necessary assistance to fish producers when they apply for migratory-bird depredation permits to manage local populations of fish-eating birds.

In Mississippi, the 1997–98 cormorant roost dispersal program coordinated by WS was a tremendous success. Cormorant numbers in the delta catfish production region were reduced by 83 percent even though the species' population doubled over the last 3 years nationwide. Personnel from 72 aquaculture facilities and organizations participated.

PROTECTION OF ENDANGERED SPECIES AND OTHER NATURAL AND CULTURAL RESOURCES

WS continues to play a substantial role in the conservation and recovery of federally listed threatened and endangered (T&E) species. In FY 1997, WS had 66 separate cooperative programs for the protection of 52 different T&E species across the country. In FY 1998, the program protected 56 T&E species in 22 different States throughout the United States and Puerto Rico. These efforts resulted in maintained or increased population levels for 84 percent of the species protected.

Hawaii provides an excellent example of how WS protected and enhanced the conservation of T&E species in 1998.

WS assists FWS and the U.S. Navy in protecting four species of federally listed endangered waterbirds and the Hawaiian goose on seven National Wildlife Refuges and DoD lands on four islands.

WS also cooperates with the State of Hawaii, the U.S. Army and Navy, and the Nature Conservancy of Hawaii to control feral ungulates on Oahu, Maui, and Hawaii. These animals threaten the survival of T&E plants, tree snails, short-eared owls, and forest birds. As part of the Newell's shearwater recovery plan, WS participates in the recovery of juvenile birds that become disoriented and land on the ground soon after fledging.

In addition to direct protection efforts such as those described earlier, WS plays an important role in the conservation and future recovery of certain T&E species that sometimes cause damage to crops, livestock, and private property. For example, the program assists in the live capture and relocation of depredating grizzly bears in Montana and Louisiana black bears in Louisiana and Mississippi. The program also assists in capturing depredating gray wolves in Montana, Idaho, Wyoming, Minnesota, and Wisconsin. Resolving damage caused by individuals of these species means that resource owners and producers are more likely to tolerate their presence.

Some additional examples of T&E species work conducted in 1998 follow.

- Collaboration between State and Federal agencies and the National Fish and Wildlife Foundation resulted in a new endangered species protection program in the Florida panhandle. Coyote, fox, and feral cat predation management actions conducted by WS will protect 10 T&E species there.
- Wyoming, Montana, South Dakota, Colorado, Arizona, and Utah are cooperating with other State and Federal agencies in the recovery of the black-footed ferret.
- A gull management project for the National Audubon Society was conducted on Jenny Island in Casco Bay near Portland, ME, in 1991 to allow roseate terns and common terns to reestablish nesting colonies there. In 1998, 12 pairs of roseate terns and 1,068 pairs of common terns nested on the 3-acre island, making its tern colony the third largest in Maine.

- The Mexican Wolf Recovery Plan calls for reintroducing this species to Arizona, and in 1998, FWS released several groups of Mexican wolves there. The plan will continue for at least 2 more years, and local farmers and ranchers are naturally concerned about increases in wolf depredation. WS negotiated an interagency agreement with FWS to remove problem wolves under the Mexican Wolf Recovery Plan and hired a wolf specialist for Arizona. This position is critical for wolf recovery efforts. Livestock producers rely heavily on the specialist for assistance.

Protecting Other Natural Resources

WS is cooperating with the Maryland Department of Natural Resources (DNR), FWS, and the University of Maryland Cooperative Fish and Wildlife Research Unit in developing a 3-year pilot program for managing nutria damage to coastal marshes along the eastern shore of Maryland. The pilot program will be conducted in the Blackwater National Wildlife Refuge.

Predator management activities in WS extend far beyond livestock protection, however. For example, program personnel in Utah, Montana, Texas, Idaho, Arizona, and Oregon are requested by State agencies and private game ranches to protect deer herds. Deer numbers in the West are declining rapidly, and game managers are looking to WS to conduct experimental projects to bring back critically suppressed herds. In Utah, WS has been working with the State DNR on 13 critical fawning areas. After 2 years of reducing coyotes in the fawning areas, the herds in three units have rebounded significantly and now surpass DNR objectives. WS expects issues regarding the decline of big-game populations to be an increasingly important issue in coming years.

PROTECTION OF PROPERTY

The Indiana DNR and WS expanded their partnership by providing a toll-free telephone service for Indiana residents. The 1-800 Nuisance Wildlife Hotline service went into effect on July 1, 1998.

Beavers cause tens of millions of dollars of damage annually to Federal, State, and county highways, forest and agricultural resources, waterways, and other property, such as sewer and water treatment facilities and landscape plantings. Frequently, damage is so overwhelming that States, counties, municipalities, and others approach WS for assistance. For example, beaver damage management work by WS in North and South Carolina in 1998 prevented an estimated $6.6 million in impending losses to timber, crops, roadways and bridges, waterways, and other property.

Comparing the value of program expenditures ($1.1 million) to resources saved ($6.6 million), the estimated cost–benefit ratio of USDA's services was 1 to 6, or $6 saved for every $1 spent.

PROTECTION OF HUMAN HEALTH AND SAFETY

WS protects humans, pets, and domestic livestock from hazards and concerns to health and safety arising from wildlife-borne diseases. These diseases are spread by both mammals and birds and through both direct and indirect contact. In 1998, WS personnel conducted more than 280 operational assistance and 5,500 technical assistance projects on wildlife-borne diseases including rabies, plague, Lyme disease, giardiasis, histoplasmosis, bovine tuberculosis, and salmonellosis. Rabies, plague, and Lyme disease accounted for approximately 5,630 of the projects.

WS serves a crucial role in the area of disease surveillance. For example, as in several other areas of the Southwest, bubonic plague is endemic to Nevada. Because of the close proximity of field rodents (carriers of plague-infested fleas) to humans, there is always the possibility of a plague outbreak. One way to combat this is to keep a close monitoring and surveillance system in place via the routine sampling of predator titers for plague.

All the urban predators handled during wildlife damage-management activities conducted by the WS program in the metropolitan area of Reno, NV, are sampled for plague, thereby helping local health departments monitor this problem. In December 1998, the WS samples indicated a possible plague problem, and WS officials passed this information on to local medical facilities. While no serious outbreak of human plague occurred in Reno, it is obvious that the WS program in Nevada played an important role in the early detection of the elevated occurrence of this potentially devastating disease.

In cooperative efforts concerning rabies control, coyotes and foxes in Texas and raccoons in the Northeast have emerged as significant public health and wildlife management problems. There are substantial financial as well as social costs associated with rabies. These costs increase dramatically as wildlife in new or broader geographic regions of the United States become infected. The availability of an oral vaccine that may be useful in containing and eliminating coyote and gray fox variants of rabies has led to oral rabies vaccination projects in Texas. This strategy of wildlife vaccination for rabies is also being tested on raccoon rabies variants in other areas of the country.

WS formed a Wildlife Rabies Management Team in FY 1998 to coordinate rabies work in Ohio, New York, Texas, and Vermont. Primary cooperators and stakeholders include the State Health Departments, Cornell University, the Centers for Disease Control and prevention, the University of Georgia (Southeast Cooperative Wildlife Disease Study), the University of Wyoming, the Ontario Ministry of Natural Resources, and the respective State wildlife agencies. In cooperation with State health departments, WS distributed more than 884,500 oral raccoon rabies vaccine baits in Ohio, New York, and Vermont by the end of fall 1998. The baits were distributed over a 3,770-square-mile area. Surveillance sampling continues to be conducted to determine program effectiveness.

WS began work in the Texas Oral Rabies Vaccination Project in 1995 through the availability of APHIS contingency funding. WS' role is a cooperative one with State agencies, universities, and other entities. The WS role may vary from State to State but includes distribution of bait and collection of rabies vector population information and surveillance samples to evaluate program effectiveness. Since the first vaccine airdrop in South Texas in 1995, the number of animal rabies cases caused by the canine strain of the virus has dropped 97 percent. Since the first airdrop in the West-Central Texas epizootic zone in 1996, the number of cases caused by the gray fox strain of rabies has fallen 88 percent. More importantly, there have been no human cases of rabies in either area since the vaccine airdrops began.

WS also assisted other agencies and universities in disease monitoring in FY 1998. The University of California at Davis has requested fecal samples from coyotes in Kern County, CA, to test for the presence of *Giardia duodenalis* and *Cryptosporidium parvum*. Researchers believe coyotes are a host passing these disease-causing organisms to surface water. The Marin/Sonoma Mosquito and Vector Control District, along with numerous other agencies, requested assistance in providing blood samples from Santa Clara County, CA, to test for human granulocystic ehrlichiosis, a tick-borne infection transmitted to humans.

Airports

In 1995, an AWACS jet aircraft taking off at Elmendorf Air Force Base, AK, crashed after striking a flock of Canada geese. All 24 crew members were killed, and the aircraft was destroyed. In an effort to prevent disasters such as this from recurring, WS provides assistance in reducing human safety risks and property damage associated with wildlife–aircraft strikes at civil and military airports.

During FY 1998, cooperative funding was provided to WS by the FAA, airports, counties, municipalities, and waste-handling facilities to conduct operational control activities on civil airports.

In 1998, WS provided technical and/or operational assistance to reduce the risk of wildlife strikes at 193 airports (157 civil, 28 military, and 8 civil–military) in 30 States and on Guam. On many of these airports (servicing 359,437,773 passengers annually), WS conducted 93 operational control projects or programs.

WS biologists also provided training to 615 airport and landfill* personnel, conducted 118 initial consultations, and completed 40 wildlife hazard assessments, 13 wildlife hazard management plans, and 15 environmental assessments.

*Landfills are often a source of bird activity and are of concern when located near or affecting airports.

WS analyzed the percent reduction in risk for more than 60 of the direct control civil airport projects/programs conducted by WS biologists. More than half these airport projects achieved a percent reduction in risk from wildlife strikes greater than or equal to 75 percent.

Customer Service and Program Evaluation

In 1993, WS established an evaluation committee to better assist customers and improve services provided. The purpose of the committee is to conduct yearly evaluations of individual State programs with regard to program operation, procurement, service delivery, customer satisfaction, and cooperative relations with State and Federal regulatory and nonregulatory agencies. During 1998, six statewide evaluations were conducted in Minnesota, Nevada, New Hampshire, New York, Ohio, and Oregon. These evaluations help increase proficiency and maintain a high standard of customer service throughout the program.

AWARDS AND PUBLIC RECOGNITION

Black Bear Conservation

USDA Secretary Dan Glickman recognized several WS employees for their outstanding achievements in FY 1998. Among these individuals, Dwight LeBlanc, WS State Director in Louisiana, was honored for his work with the Black Bear Conservation Committee and assistance in restoring the Louisiana black bear. As chairman of the committee's conflict management team, LeBlanc coordinated the development of a protocol addressing conflicts between humans and the Louisiana black bear. He also wrote the Solutions to Human/Bear Conflicts chapter in the first and second editions of the committee's "Black Bear Management Handbook." In August 1997, the committee gave LeBlanc its Chairman's Award. During spring 1997, LeBlanc also assisted in planning and implementing a major damage-management project for one of the Nation's largest commercial beekeepers.

Jack H. Berryman Award

Retired NWRC employee Guy Connolly received the Jack H. Berryman Institute Award for Lifetime Career Contribution on March 3, 1998, at the 18th annual Vertebrate Pest Conference in Costa Mesa, CA. Connolly has had a distinguished research career with NWRC, contributing to a number of projects on control of coyote-caused depredation, including development of the Livestock Protection Collar and the M–44 device. In addition to his numerous publications on coyote biology and management, Connolly has also published more than 30 papers on mule deer and Columbian black-tailed deer.